

*Neopercis* includes four known species, all shore-fishes—one from the Bay of St. Vincent (Australia), *N. Ramsayi*, Steind., the three others from Japan, *N. sexfasciata*, Schl., *aurantiaca*, Död., and *multifasciata*, Död.

The Cape-Verd species seems to approach the last-named most closely; in fact it has to be carefully examined to find distinctive characters. The general coloration agrees; but in the Cape-Verd species the bands of the body occupy the whole depth instead of ceasing at the lateral line, the nuchal spot is produced on each side upon the opercular plates, and a band bordered with black descends obliquely upon the cheek behind the lower margin of the orbit. The pectoral fins do not notably pass the origin of the anal, the interorbital space is scarcely one third of the diameter of the eye, and the maxillary stops at the anterior margin of the orbit.

The species is named *Neopercis atlantica*, and its presence among the African islands is the more singular because not only all the other species of *Neopercis*, but the more numerous representatives of the genus *Percis*, are known only from the warm or temperate parts of the great Pacific Ocean or the Indian seas.—*Comptes Rendus*, November 21, 1887, p. 1032.

*On the Pelagic Fauna of some Lakes in Auvergne.*

By M. J. RICHARD.

Last summer the author investigated the pelagic fauna of the following five lakes in the region of Mont Dore:—Pavin, Chambon, Guéry, Montcineyre, and Bourdouze. He generally worked at depths between 2 and 3 metres, but sometimes lower, down to 11 metres. He obtained twenty species belonging to the groups of Cladocera, Copepoda, Rotatoria, and Ciliophagellata.

The distribution of the species in these five neighbouring lakes is irregular, which may be explained by the difficulties in the way of the dispersion of pelagic animals. Thus *Hyalodaphnia cucullata*, Sars, var. *apicata*, Kurz, occurred only in Lake Chambon, and *Polyphemus pediculus*, De Geer, was met with only in Lake Pavin.

A remarkable species, regarded as characteristic of mountain-lakes, *Holopedium gibberum*, Zaddach, occurred in immense numbers in the lake of Guéry at a height of 1240 metres. It was also found, but less abundantly, in Lake Montcineyre, the most southern point reached by this species\*.

In the neighbouring lakes Montcineyre and Bourdouze several species common to both occurred only in small numbers, being stray littoral species, namely:—*Sida crystallina*, O. F. Müll., *Alona affinis*, Leyd., *Acroperus leucocephalus*, Koch, and *Chydorus sphaericus*, Jurine.

Besides these few examples of very restricted dispersion, there are many cases of wide distribution: thus, *Daphnia longispina*, Leyd., is

\* It was found recently, and for the first time in France, by MM. Dollfus and Moniez in the lake of Gerardinier.

wanting only in Lake Chambon; *Diaptomus castor*, Jurine, is wanting in lakes Chambon and Guéry; and both species abound in the other lakes. In Lake Pavin, to 7 or 8 metres from the shore, *D. castor* was of a bright vermilion-red; in the middle, to a depth of 11 metres, it was colourless.

*Cyclops strenuus*, Fischer, which is very abundant in small pieces of water, occurred in innumerable troops in all the lakes except Montcineyre. In the lakes it is colourless, while in small sheets of water it is generally red. The pelagic variety in the lakes is more slender, and in some respects approaches *C. lucidulus*, Koch. *Bosmina longirostris*, O. F. Müll., is wanting only in Lake Pavin; it abounds in lake Guéry, in company with *Holopedium gibberum*. These last four species are very common and abundant, and thus have the better chance of dispersion.

*Ceriodaphnia pulchella*, Sars, found abundantly in the lakes of Bourdouze and Montcineyre, is here clearly pelagic, as in the lakes of North Germany and in Gerardiner. Lastly, *Daphnella Brandtiana*, Fisch., occurred in immense numbers in lakes Chambon and Bourdouze.

With regard to the Rotatoria and Cilioflagellata the same remarks as to regularity of dispersion will apply. *Anuraea longispina*, Kellcott, was abundant in Lake Pavin, rare in Lake Chambon; *A. cochlearis*, Gosse, free, but very rare in Lake Montcineyre, and in the stomach of *Asplanchna helvetica*, Imhof, in Lake Bourdouze. *Asplanchna helvetica* was also met with in Lake Guéry. In Lake Chambon examples of *Anuraea curvicornis*, Ehr., were found in the stomachs of many specimens of *Asplanchna Girodi*, De Guerne. Colonies of *Conochilus volvox* were found abundantly in Lakes Pavin and Montcineyre.

Among the Cilioflagellata the author mentions only *Ceratium longicorne*, Perty, as being rare in Lakes Montcineyre and Bourdouze. He also refers to the Hydrachnids, *Atax crassipes*, O. F. Müll., *Axona versicolor*, O. F. Müll., *Nesaea rotunda*, Kram., and *N. reticulata*, as occurring in the lakes.

---

Among the Cladocera, *Hyalodaphnia cucullata*, Sars, var. *apicata*, Kurz, of which the latter author makes a distinct species, is new to the French fauna. This variety had hitherto been found only in Bohemia. A new Rotifer, *Asplanchna Girodi*, has been studied by M. J. de Guerne\*.

Comparing the pelagic fauna of the lakes of the Auvergne with those of various European countries, we find that it has some points in common with all and that it differs from all in other points. Thus the following species are common to the lakes of the Mont

\* 'Excursions zoologiques dans les îles de Fayal et de San Miguel (Açores),' Paris, 1887. In a monographic note on the genus *Asplanchna* M. J. de Guerne describes and figures *A. Girodi*.

Dore and those of North Germany:—*Ceriodaphnia pulchella*, Sars; *Hyalodaphnia apicata*, Kurz; *Bosmina longirostris*, O. F. Müll.; *Conochilus volvox*, Ehrbg.; *Anuraea cochlearis*, Gosse; *A. longispina*, Kellicott; *Asplanchna helvetica*, Imhof. But many other species do not occur in the Auvergne, while, on the other hand, *Holopedium gibberum*, Zaddach, has not been found in the lakes of North Germany. A comparison with the various European faunas gives similar results.

Comparisons thus made are not of great importance, especially for the establishment of regions with distinct pelagic faunas. In the first place it is necessary to make continuous and methodical investigations at different periods of the year. The European lakes will then, for the most part, present a multitude of common species, transported from the north of Europe, their centre of dispersion, from lake to lake, in the state of winter-eggs, by birds or by the winds. It is only by passive migrations that we can explain the existence of the pelagic fauna in the artificial lakes of Bohemia, for example, and particularly in the lakes of the Auvergne, as is shown by their geological situation. It is only in this way that we can understand how M. J. de Guerne\* could have found in the Azores a perfectly European pelagic fauna in a crater-lake which dates from the fifteenth century.

Forel and Pavesi have established two groups which they regard as very distinct in the population of the middle of the lakes—that of the *eupelagic* species, which live only in the middle, and that of the *tychopelagic* species, which are littoral forms adapted to a life in the open water. According to this division there are in the lakes of Mont Dore only two *eupelagic* Cladocera, namely *Holopedium gibberum* and *Hyalodaphnia apicata*. This second species, however, is very numerous in the littoral zone. This is the case also with all the Rotatoria enumerated, several of which are regarded as *eupelagic* by Pavesi. These species, which, according to the definition given, ought only to occur in the middle of the lakes, seem, considering their number, to have adapted themselves to the life of the littoral animals. Ought we to invent for them an analogous term in opposition to the term *tychopelagic*? Probably no one will regard this as necessary.

What is certain is that a great number of species can live equally well in the pelagic region and in the littoral region. In the former case the animals become hyaline, more slender, and better swimmers.

*Diaptomus castor* is a striking example of the well-known fact just referred to. This animal is very abundant on the Mont Dore, and has all the characters of the eupelagic species. It does not occur, according to Zacharias, in the middle of the lakes of North Germany. Sars says that it seems to constitute an exception from the other Calanidae by occurring only in small pools. Lake Pavin, which is 800 metres in diameter, with a depth of 95 metres, should hardly be ranged under this category. It is but small indeed

\* *Loc. cit.*

when compared with the Norwegian lakes. But then *Holopedium gibberum* of Lake Guéry lives in a shallow pool of water! This lake is, in fact, of less extent than Lake Pavin and hardly 8 metres in depth.

With creatures of the size here in question the mass of water in Lake Pavin and much more considerable masses will hardly prove to be very different in their action.

Two principal conclusions may be drawn from the facts hitherto ascertained:—

1. The peopling of the lakes of the region of the Mont Dore appears to have been effected by passive migrations.

2. The pelagic fauna of these lakes is constituted in a general way like those of the rest of Europe, and presents common points and points of divergence when compared with these different faunas. —*Comptes Rendus*, Nov. 14, 1887, p. 951; Dec. 12, 1887, p. 1186.

*The Fauna of the Podophthalmous Crustacea of the Bay of Marseilles.*  
By M. PAUL GOURRET.

The author states that the number of Podophthalmous Crustacea observed by him, of which he proposes to publish a revision, amounts to 124 species or varieties, 11 of which are new. These are:—

*Pinnotheres Marioni*, *Galathea Purroceli*\*, *Crangon Lacazei*\*, *Gnathophyllum elegans*, var. *brevirostris*\*, *Alpheus Gabrieli*\*, *Hippolyte Marioni*\*, *Pontonia vagans*, *Callianassa subterranea*, var. *minor*\*, *Siriella intermedia*, *Leptomysis Marioni*, and *Nebalia bipes*, var. *elongata*.

The fauna greatly resembles that of the Adriatic—90 species are common to both. There is almost as close a similarity to the faunas of Naples, Nice, and Algeria, the number of common species oscillating between 82 and 66. The difference is much greater from the Spanish carcinological fauna (Balearic Islands and Madeira), which seems to include only 34 of the species obtained at Marseilles. This difference may be due to our imperfect knowledge of the Spanish fauna.

The following species obtained at Marseilles do not occur in any of the principal Mediterranean stations:—

*Plagusia chabrus*, *Pachygrapsus transversus*, *Ebalia nux*, *Eupagurus Bernhardus* and *levis*, *Axius stirhynchus*, *Gebia deltura*, *Munida tenuimana*, *Galathodes Marionis*, and *Crangon trispinosus*.

Of these species, however, the first two are imported into Marseilles by ships from the Pacific, whilst *Ebalia nux*, *Eupagurus levis*, *Munida tenuimana*, and *Galathodes Marionis* are species dredged from great depths. The four remaining species present a curious distributional fact, although *Gebia deltura* has been taken

\* These forms were briefly described in a paper communicated by the author to the Academy on November 21, 1887.